

1- Protective mechanisms of eye include all of the following EXCEPT:
A- Boney orbit.
B- Lacrimal apparatus.
C- Eye lid.
D- Corneal transparency.

2- Functions of tears include all of the following EXCEPT:
A- Buffering of corneal pH.
B- Facilitation of eye lid movement.
C- Corneal nutrition.
D- Maintain uniformity of corneal surface.

3- Regarding the cornea:
A- It has a resting dioptric power of 24 diopters.
B- Increases its dioptric power in response to near vision.
C- Contains irritant receptors.
D- Its low curvature helps in strong refraction of light.

4- Corneal transparency is due to all of the following EXCEPT:
A- Non keratinized outer epithelium.
B- Na pump of inner epithelium that helps corneal dehydration.
C- High degree of curvature.
D- Regular uniform arrangement of fibrils of substantia propria.

5- Aqueous humor:
A- Secreted by ciliary processes by a lry passive process.
B- Carbonic anhydrase enzyme helps in its formation.
C- Continuously formed and reabsorbed at a rate of 12 ml/day.
D- Keeps the pressure inside eyes constant at 42 mmHg.

6- Regarding aqueous humor, all of the following is true EXCEPT:
A- Responsible for intraocular pressure.
B- Supplies nutrients and removes metabolites from surrounding structures.
C- Drained mainly in posterior chamber.
D- Episcleral trabecular spaces represent the main mechanism of its drainage.

7- Regarding intraocular pressure:
A- Is the pressure caused by vitrous humor inside the eye.
B- Its normal range is 15-30 mmHg.
C- Exerts flattening pressure on lens during far vision.
D- Keeps the suspensory ligaments stretched during near vision.

8- Glaucoma:

- A- Is the increase in intraocular pressure more than 10 mmHg.
- B- It is mainly due to increase aqueous formation.
- C- It may be due to obstruction of iridocorneal angle or obstruction of the trabecular spaces responsible for aqueous drainage.
- D- Results in increase convexity of anterior surface of lens.

9- Glaucoma, all of the following is true EXCEPT:

- A- Is treated by Atropine.
- B- Is treated by carbonic anhydrase inhibitors.
- C- Results in failure of the ability of lens to change its dioptric power in near vision.
- D- Results in pressure on retina that may lead to blindness.

10- Regarding lens of eye:

- A- Its posterior surface is ^{less} more curved than anterior surface.
- B- Is responsible for the greatest part of lens dioptric power during far vision.
- C- Can increase its dioptric power to help light refraction on looking at a near object.
- D- In cataract, there is failure of accommodation.

11- Near response includes all of the following is true EXCEPT:

- A- Medial convergence of both eyes.
- B- Stimulation of somatic and autonomic fibers of oculomotor nerve.
- C- Contraction of ciliary muscle and relaxation of suspensory ligaments.
- D- Contraction of dilator pupillae muscles of both eyes.

12- In near response:

- A- Miosis helps in focusing of image of near object on corresponding parts of retina.
- B- Medial convergence helps to prevent falling of light on peripheral parts of lens.
- C- Contraction of ciliary muscle leads to stretch of suspensory ligaments.
- D- Increase convexity and dioptric power of anterior surface of lens.

13- A lens can focus light rays at a 25 mm distance behind its center, the dioptric power of this lens in diopters is:

- A- 40.
- B- 50.
- C- 30.
- D- 25.

14- Near response:

- A- Decreases by decrease in lens transparency.
- B- Increases with advancing age.
- C- Lost in glaucoma.
- D- Occurs when objects are at a distance of 6 meters and more from eyes.

15- Regarding refractive errors, all of the following is true EXCEPT:
A- Emmetropic eye can focus parallel light rays on retina with accommodation.
B- At near point, there is maximal accommodation.
C- At far point, there is no accommodation.
D- Power of accommodation decreases by age.

16- Regarding errors of refraction:
A- Presbyopia occurs due to increase dioptric power of cornea or lens.
B- Myopia occurs in keratoconus.
C- Spasm of ciliary muscle results in hypermetropia.
D- Astigmatism is due to aphakia.

17- In errors of refraction:
A- Near point recedes away from eyes in presbyopia.
B- Near point becomes more than normal in myopia.
C- Near point is closer to eyes in hypermetropia.
D- Astigmatism affects near point more than far point.

18- In errors of refraction, all of the following is true EXCEPT:
A- Far point becomes near than normal in myopia.
B- Far point remains normal, with the use of accommodation in hypermetropia.
C- Far point is unchanged in presbyopia.
D- Far point is unchanged in all errors of refraction.

19- In refraction errors:
A- Presbyopia is corrected by a biconcave lens.
B- Myopia is corrected by a biconvex lens.
C- Hypermetropia is corrected by a converging lens.
D- Astigmatism is corrected by diverging lens.

20- Regarding the iris:
A- It is one of the refractive eye media.
B- Dilatation of its pupil prevents chromatic and spherical aberrations.
C- Regulates light entry to eyes.
D- Has a dominant tone of dilator pupillae over constrictor pupillae muscle.

21- In Light reflex, all of the following is true EXCEPT:
A- Can be used for diagnosis and localization of lesions in visual pathway.
B- It involves constriction of pupil of both eyes in response to light exposure of one eye.
C- Its indirect part is due to bilateral stimulation of lateral geniculate body by pretectal area.
D- It is lost without loss of near response in case of tabes dorsalis.

✓ 3

22-All of the following result in pupillary constriction EXCEPT:
A- 3rd stage of anaesthesia.
B- Horner's syndrome.
C- Impulses from pretectal areas and superior colliculus to EWN
D- Parasympatholytic drugs.

23-All of the following result in pupillary Dilatation EXCEPT:
A- 2nd & 4th stages of anaesthesia.
B- Morphine.
C- Stress and emotions.
D- Decrease impulses from pretectal area and superior colliculus.

24-Which of the following occurs during near response:
A- Both eyes converge.
B- The curvature of cornea increases.
C- Spherical and chromatic aberrations increase.
D- Increase convexity of posterior lens surface.

25-Regarding hyperopia:
A- Can see near objects better than far objects.
B- Corrected by concave lens.
C- Excessive accommodation can produce squint in children.
D- Parallel light rays are focused in front of retina.

26-All of the following statements are true EXCEPT:
A- Amauratic pupil gives normal indirect light reflex.
B- Light-near dissociation occurs due to tabes dorsalis.
C- Hemianopic pupil gives normal bilateral light reflex when light falls from the normal field half.
D- Dilated irreactive pupil is a complication of 3rd stage of anaesthesia.

27-Concerning the retina:

A- Rods and cones receive their blood supply from choroid by diffusion.
B- The 1st and the 2nd order neurons of visual pathway lie inside the retina.
C- Ganglion cells are stimulated by bipolar and horizontal cells.
D- Pigment epithelial cell layer is in direct contact to vitreous humor.

28-Acuity is maximal at fovea due to all of the following EXCEPT:

A- Visual receptors in fovea are only cones.
B- In the fovea, no convergence of impulses.
C- Rods and cones of fovea are connected to bipolar cells in 1:1 ratio.
D- Highly developed pigmented epithelium.



29-Rods differ from cones in that they are of:
A- Less number.
B- High threshold.
C- Low sensitivity.
D- Low acuity.

30-Cones differ from rods in that they are characterized by:
A- Low color perception ability.
B- Responsible for scotopic vision.
C- Contain iodopsin pigment.
D- High convergence ratio.

31-Scotopic vision differs from photopic vision in:
A- It is central vision.
B- The most luminous is the 505 nm wave length of the spectrum
C- All colors of the spectrum are perceived clearly.
D- It is high acuity vision.

32-Vitamin A deficiency leads to all of the following are true EXCEPT:
A- Nyctalopia and difficulty in dark adaptation.
B- Degeneration of cones.
C- The iris color appears red.
D- Degeneration of neural layers of retina.

33-During phototransduction:
A- Na^+ influx depolarizes visual receptors.
B- Breakdown of cGMP leads to closure of Na^+ pumps.
C- Glutamate released from receptors directly excites bipolar cells.
D- Receptor membrane potential shifts to a more negative value.

34-During dark conditions:
A- The concentration of receptor photosensitive pigments is increased.
B- Pupillary constriction occurs.
C- Pigments in rods are more rapidly regenerated before pigments in cones.
D- The sensitivity of retina is decreased.

35-During exposure to excess light:
A- The pupil dilates maximally.
B- The retinal threshold is increased.
C- Retinal sensitivity is increased.
D- Regeneration of pigments is more than bleaching.

(V₅)

36-All of the following result in failure of dark adaptation EXCEPT:
A- Anaesthesia.
B- Hypoxia.
C- Presbyopia.
D- Carbon monoxide poisoning.
E- Myopia.
F- Heavy smoking and tobacco.
G- Vitamin A deficiency.

37-Cortical visual areas:

A- Perception of color is the function of visual association cortex.
B- Visual association cortex is responsible for fusion of the images of both retinae to prevent diplopia.
C- Primary visual cortex is responsible for initiation of accommodation reflex.
D- Primary visual cortex localizes the position of object in space.
E- Lesion in primary visual cortex leads to visual agnosia

38-Lesion in the left peripheral part of optic chiasma results in:

A- Left eye nasal hemianopia.
B- Bitemporal heteronymous hemianopia.
C- Binasal heteronymous hemianopia.
D- Left eye blindness.

39-Lesion in anterior part of right optic tract leads to:

A- Left homonymous hemianopia with macular sparing.
B- Left homonymous hemianopia with hemianopic pupil.
C- Right homonymous hemianopia with macular sparing.
D- Right homonymous hemianopia with hemianopic pupil.

40-Lesion in the left temporal optic radiations leads to:

A- Right homonymous superior quadrantanopia.
B- Left homonymous superior quadrantanopia.
C- Right homonymous inferior quadrantanopia.
D- Left homonymous inferior quadrantanopia .

41- Which of the following lesions produce right homonymous hemianopia with macular sparing:

A- Left optic radiations.
B- Right optic radiations.
C- Right visual cortex.
D- Left visual cortex.

✓6

42 In which of the following lesions no response to light occurs when light comes from the temporal field of the right eye?

- b) Left anterior optic tract lesion
 c) Left posterior optic tract lesion.

1	D
2	A
3	C
4	C
5	B
6	C
7	C
8	C
9	A
10	C
11	D
12	D
13	A
14	C
15	A
16	B
17	A
18	D
19	C
20	C

21	C
22	D
23	B
24	A
25	C
26	D
27	B
28	C
29	D
30	C
31	B
32	C
33	D
34	A
35	B
36	C
37	D
38	A
39	B
40	A

[illegible]

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1- Concerning renal functions:

- A- Kidneys play a role in regulation of plasma pH.
- B- Acute renal failure results in loss of endocrine functions of kidneys.
- C- Chronic renal failure can be corrected by artificial kidney.
- D- Microcytic anemia is an association of renal diseases.

2- Nephrons:

- A- Are made up of a vascular and muscular components.
- B- 75% of normal nephrons act as reserve inside the body.
- C- Cortical nephrons constitute 15% of total nephrons.
- D- Juxtamedullary nephrons are the primary ones responsible for the GFR.

3- Juxtamedullary nephrons:

- A- Have a missed thin ascending limb of loop of Henle.
- B- Have thick muscular afferent arterioles.
- C- Main function is Na^+ reabsorption.
- D- Have no macula densa.

4- Cortical nephrons:

- A- Have a missed thin ascending limb of loop of Henle.
- B- Have thin muscular afferent arterioles.
- C- Main function is water reabsorption.
- D- Have no macula densa.

5- Juxtaglomerular apparatus:

- A- Present in all types of nephrons.
- B- Macula densa is responsible for renin formation and secretion.
- C- Sympathetic nerves activate the macula densa.
- D- Play a role in tuboglomerular feedback involved in autoregulation of renal blood flow and GFR.

6- Juxtaglomerular apparatus.

- A- Contains mesangial cells that secrete rennin.
- B- Sympathetic nerves activate the juxta-glomerular cells.
- C- Macula densa monitors changes in pressure within afferent arteriole.
- D- Juxta-glomerular cells act to monitor NaCl concentration in tubular fluid.
- E- Renin secretion is directly proportionate to the degree of stretch in wall of afferent arteriole.

(R₁)

7- Renal blood flow:

- A- Normally is about 10 % of cardiac output.
- B- Most of it passes in peritubular capillaries and little amount passes in vasa recta.
- C- Is greater in renal medulla than cortex.
- D- Vasa recta offer little resistance to blood flow.

8- Renal blood flow:

- A- Is inversely proportionate to mean arterial pressure.
- B- Is directly proportionate to renal vascular resistance.
- C- Decreases by 10% when arterial pressure decreases by 10%.
- D- Most of resistance to blood flow is found in afferent and efferent arterioles.

9- Regulation of renal blood flow, all are true EXCEPT:

- A- Sympathetic constricts renal vessels leading to decrease RBF, GFR & filtration fraction.
- B- Low levels of angiotensin-II constrict efferent arteriole and increase GFR.
- C- High levels of angiotensin-II constrict afferent arteriole and decrease GFR.
- D- Intrinsic autoregulation operate in pressure range of 50-150 mmHg.

10- Intrinsic autoregulation of RBF & GFR:

- A- Is a property of juxtamedullary nephrons.
- B- Operates by myogenic property of efferent arteriole.
- C- Operates even beyond pressure 180 mmHg.
- D- Macula densa is responsible for tubuloglomerular feedback mechanism of autoregulation.

11- Urine formation:

- A- Excretion = filtration – reabsorption + secretion.
- B- Depends primarily on filtration process.
- C- Involves 3 selective processes.
- D- Excretion is the same as secretion.

12- Renal plasma clearance, all are true EXCEPT:

- A- Is measured in unit of volume per unit of time.
- B- Measures the effectiveness of kidneys to remove substances from ECF.
- C- It is the process that removes unwanted substances either from glomerular capillary or from peritubular capillary to lumen of renal tubules.
- D- Is inversely proportionate to the urine concentration of the substance.

(R₂)

13- Which of the following should not be a character of substance used in measurement of GFR:

- A- Stored in the kidney.
- B- Mode of handling is only filtration.
- C- Easy to measure in urine and plasma.
- D- Physiologically inert and not synthesized or metabolized by the tubule.

14- Inulin, all are true EXCEPT:

- A- A polymer of fructose.
- B- Is safe and used in clinical evaluation of GFR.
- C- Molecular weight is about 5000.
- D- Is filtered, not reabsorbed and not secreted by kidneys.

15- Creatinine:

- A- Is used clinically in evaluation of GFR, although it is not accurate.
- B- Is filtered, not reabsorbed and not secreted by the kidneys.
- C- Is exogenous and allergic.
- D- Is very accurate in measurement of GFR.

16- Renal plasma clearance:

- A- Of inulin is lower than that of glucose.
- B- Of creatinine is higher than that of PAHA.
- C- Of glucose is lower than that of urea.
- D- Of urea is higher than that of creatinine.

17- PAHA, all are true EXCEPT:

- A- 90 % is removed from blood in a single circulation.
- B- Measures the effective renal plasma flow.
- C- Its level can be measured easily.
- D- Is filtered, not reabsorbed and not secreted in kidneys.

18- Glomerular filtration, all are true EXCEPT:

- A- Is an ultrafiltration of plasma.
- B- Allows filtration of plasma substances of colloidal size.
- C- Is a passive process.
- D- Osmolarity of filtered fluid is 300 mosmol/L as plasma.

19- GFR:

- A- Is measured in units of time per units of volume.
- B- Is normally higher by 10% in males than females.
- C- Is normally 175 ml/min.
- D- Is an active process.

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20- Filtration fraction, all are true EXCEPT:

- A- Is the volume of plasma completely cleared from a certain substance per minute.
- B- Is the percentage of renal plasma flow that becomes a glomerular filtrate.
- C- Is normally 16-20 %.
- D- Is not affected by vasodilatation or vasoconstriction of afferent arteriole.

21- Filtering membrane:

- A- The membrane that separates blood in peritubular capillaries from Bowman's capsule.
- B- Its endothelial layer is non-fenestrated capillaries.
- C- Epithelial cells of Bowman's capsules contain narrow filtration slits.
- D- Its basement membrane contains pores.

22- Filtering membrane:

- A- Is 5 times more permeable than other capillaries.
- B- Its total surface area is 1.5 square meters.
- C- Is an active semipermeable membrane.
- D- Contains contractile mesangial cells between basal lamina and endothelium.

23- Filtering membrane, all are true EXCEPT:

- A- Allows free filtration of substances less than 4 millimicrons (MW 5500).
- B- Does not allow filtration of substances more than 8 millimicrons (MW 70000).
- C- Neutral substances are easily filtered than -ve substances.
- D- Negative substances are easily filtered than +ve substances.

24- Mechanism of GFR:

- A- Glomerular capillary hydrostatic pressure is about 32 mmHg.
- B- Intracapsular pressure opposes filtration.
- C- Decrease plasma proteins lead to decrease filtration.
- D- Colloidal pressure of proteins in Bowman's capsule is normally high.

25- GFR is determined by all of the following EXCEPT:

- A- The net filtration pressure.
- B- The glomerular capillary filtration coefficient.
- C- Filtration coefficient is determined by permeability and surface area.
- D- The active glomerular pumping mechanisms.

26- Glomerular capillary:

- A- Is less permeable than other body capillaries.
- B- A less volume is filtered across which at any given pressure difference.
- C- Allow only filtration throughout the length of the capillary.
- D- Allows reabsorption at its venous end.

(R₄)

27- GFR:

- A- Mild constriction of efferent arteriole decreases the GFR
- B- Severe constriction of efferent arteriole increases, then decreases the GFR.
- C- Increase mean arterial pressure to 150 mmHg causes a marked increase in GFR
- D- Sympathetic stimulation causes increase in GFR.

28- GFR:

- A- GFR is directly proportionate to plasma protein concentration.
- B- GFR is directly proportionate to Bowman's capsule hydrostatic pressure.
- C- GFR is directly proportionate to functioning kidney mass.
- D- Hypoxia and fever decrease permeability of filtering membrane and decrease GFR.

29- GFR:

- A- Is increased in hypoproteinemia.
- B- Is increased in uretric obstruction or tight renal capsule.
- C- Is increased in renal disease.
- D- Is increased by contraction and decrease by relaxation of mesangial cells.

30- Tubular transport processes:

- A- Is the movement of substances from tubular lumen to plasma of peritubular capillaries.
- B- Occur by transcellular pathway between adjacent cells through tight junctions.
- C- Of the transcellular pathway is only active.
- D- Transports substances from tubular lumen to peritubular ECF.

31- Transepithelial transport involves all of the following layers EXCEPT:

- A- The luminal membrane of epithelial cells.
- B- The basolateral membrane of epithelial cells.
- C- The membrane of RBCs.
- D- The wall of peritubular capillary.

32- In proximal convoluted tubule:

- A- Most of renal transport processes are hormonal dependent.
- B- Reabsorption is isoosmotic.
- C- Active reabsorption of 65% of water occurs.
- D- Passive reabsorption of 65% of urea occurs.

33- In proximal convoluted tubule, all are true EXCEPT:

- A- Glucose and amino acids are completely reabsorbed.
- B- It is the only site for PAHA secretion.
- C- Sodium, water and urea are partially reabsorbed.
- D- Inulin and Creatinine are partially reabsorbed.

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- 34- Sodium reabsorption in proximal tubule:
- A- Is enhanced by aldosterone hormone.
 - B- Is active across luminal membrane (brush border) of epithelial cells.
 - C- Is 1st active across basolateral membrane of epithelial cells by sodium-potassium pump.
 - D- Is coupled with glucose or amino acid secretion.

- 35- Reabsorption in proximal tubule, all are true EXCEPT:
- A- Sodium reabsorption results in reabsorption of glucose and amino acids by a 2nd active mechanism.
 - B- Chloride follows sodium by 2nd active mechanisms.
 - C- Water follows sodium by osmosis.
 - D- Has no effect on osmolarity of tubular fluid.

- 36- Which of the following hormones affect functions of proximal tubule?
- A- Aldosterone.
 - B- Antidiuretic hormone.
 - C- Parathyroid hormone.
 - D- Insulin hormone.

37- Glucose reabsorption:

- A- Is completed in distal tubule and collecting ducts.
- B- Occurs with sodium by the same carrier at the luminal membrane.
- C- Occurs with sodium by a cotransport carrier at the basolateral membrane.
- D- Is a passive mechanism.

38- Tubular transport maximum, all are true EXCEPT:

- A- Is the maximal amount of a substance reabsorbed or secreted per minute.
- B- Is increased by the effect of hormones.
- C- Depends on the number of carriers.
- D- Is reached when all carriers are saturated.

39- T_mG:

- A- Is higher in females than males.
- B- Is decreased with advancing age due to decrease number of carriers.
- C- Is increased in presence of insulin hormone.
- D- It is the plasma glucose above which glucose starts to appear in urine.

40- Glucose reabsorption:

- A- All nephrons have the same reabsorbing capacities for glucose.
- B- Is almost completed in proximal tubule.
- C- Is complete when the filtered load of glucose is higher than 225 mg%.
- D- Is not affected when sodium pump function is interrupted.

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- 41- Reabsorption in proximal tubule:
- A- Water reabsorption is obligatory and not affected by vasopressin hormone.
 - B- Urea reabsorption is active.
 - C- Urea concentration is decreased at the end of the proximal tubule.
 - D- Phlorizin inhibits sodium reabsorption.

- 42- Loop of Henle, all are true EXCEPT:
- A- 15 % of filtered water is reabsorbed in the descending limb.
 - B- 25 % of filtered sodium is reabsorbed in ascending limb.
 - C- The thin ascending limb reabsorbs sodium passively.
 - D- The thick ascending limb reabsorbs sodium actively by a cotransport carrier with glucose.

- 43- Loop of Henle:
- A- Magnesium and calcium are reabsorbed passively 2^{nd} to potassium movement from tubular cells to tubular lumen.
 - B- Its function is primarily hormonal dependent.
 - C- Reabsorbs more water than solutes (sodium).
 - D- The fluid leaving the ascending limb is hypertonic.

- 44- Distal convoluted tubule and collecting ducts (distal nephron):
- A- Reabsorbs 25 % of filtered sodium independent on hormones.
 - B- Reabsorbs 25 % of filtered water under effect of ADH.
 - C- Sodium reabsorption is coupled with hydrogen & potassium secretion.
 - D- Have higher permeability to water than proximal tubule.

- 45- Potassium, all are true EXCEPT:
- A- All filtered potassium is reabsorbed.
 - B- Potassium in urine is due to secretion in distal tubule and collecting ducts.
 - C- Acidosis decreases potassium secretion.
 - D- Aldosterone decreases potassium secretion.

- 46- Tubular function regulation:
- A- Increase peritubular capillary hydrostatic pressure results in increase tubular reabsorption.
 - B- Increase glomerular filtration leads to increase tubular reabsorption (glomerulo-tubular balance).
 - C- Increase blood pressure increases reabsorption by stimulating renin secretion.
 - D- Sympathetic stimulation decreases sodium reabsorption.

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47- Renal counter current mechanisms:

- A- Are the loop of Henle and vasa recta of juxtamedullary nephrons.
- B- Are responsible for increasing water permeability in collecting ducts.
- C- Act only actively to concentrate urine.
- D- Are the loop of Henle and vasa recta of cortical nephrons.

48- Counter current multiplier system:

- A- Maintains the hypertonic medullary interstitial fluid.
- B- Depends on active transport of sodium out of thick ascending limb.
- C- Is caused by high urea concentration in medulla.
- D- Occurs due to activity of ADH.

49- Counter current exchanger system:

- A- Builds a hypertonic medullary interstitial fluid.
- B- Is performed by active transport of sodium from thick ascending limb.
- C- Is a passive action of vasa recta to maintain the medullary interstitial fluid hypertonic.
- D- Is due to urea recycling in medulla.

50- Counter current mechanisms, all are true EXCEPT:

- A- Build and maintain a hypertonic medullary interstitial fluid.
- B- Maximal hypertonicity occurs near the papilla (1400 mosmol/L) and minimal hypertonicity occurs near the cortex (400 mosmol/L).
- C- Caused by structures that pass through the whole length of the medulla.
- D- Lead to active absorption of water from medullary collecting duct.

51- Urea, all are true EXCEPT:

- A- Plays a role in establishment of a hypertonic medullary interstitial fluid.
- B- If its concentration is high, it diffuses to descending limb of loop of Henle and descending limb of vasa recta.
- C- Is reabsorbed actively from medullary collecting duct to medullary interstitial fluid.
- D- Its concentration increases by the end of proximal tubule.

52- Water reabsorption, all are true EXCEPT:

- A- 80 % is obligatory, independent on ADH occurring in proximal tubule and descending limb of loop of Henle.
- B- 5 % is facultative, under control of ADH occurs in distal tubule.
- C- About 15 % is facultative; under control of ADH occur in collecting ducts.
- D- Is high in ascending limb of loop of Henle.

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53- Urine concentration and dilution, all are true EXCEPT:
A- Normally, urine volume is 1500 ml/day and its osmolarity is 400 mosmol/L.
B- In overhydration, ADH is decreased leading to excretion of a large volume of diluted urine with osmolarity about 100 mosmol/L.
C- In dehydration, ADH is increased leading to excretion of little urine of about 400 ml/day with high osmolarity up to 1400 mosmol/L.
D- In complete absence of ADH (diabetes insipidus), there is excretion of a small amount of concentrated urine.

54- Diuresis and diuretics:
A- Is the decrease in urine output.
B- Drinking large volumes of water inhibit ADH.
C- Water diuresis is associated with excretion of large volumes of isoosmotic urine.
D- Water diuresis is due to inhibition of the obligatory water reabsorption in proximal tubule and descending limb of loop of Henle.

55- Diuresis, all are true EXCEPT:
A- Water diuresis may be associated with production of more than 10 ml urine per minute.
B- Osmotic diuresis may be associated with production of larger urine volumes than water diuresis.
C- ADH is normal or increased in osmotic diuresis but it is decreased in water diuresis.
D- In osmotic diuresis, urine is hypotonic.

56- Diuresis, all are true EXCEPT:
A- Osmotic diuresis occurs due to the presence of osmotically active unreabsorbed solutes in the tubular lumen such as mannitol and urea.
B- High blood pressure inhibits diuresis by enhancing renin secretion.
C- Urine of osmotic diuresis is isoosmotic or hypertonic.
D- Urine of water diuresis is hypotonic.

57- Diuretic drugs, all are true EXCEPT:
A- Carbonic anhydrase inhibitors cause diuresis by inhibiting hydrogen secretion and so inhibiting Na reabsorption.
B- Loop diuretics act by inhibiting the cotransport carrier of sodium and glucose.
C- Aldosterone inhibitors are potassium sparing.
D- Thiazides inhibit sodium reabsorption in early portion of distal tubule.

58- ADH:
A- Increases urine volume and decreases its osmolarity.
B- Results in obligatory water reabsorption in collecting ducts.
C- In its absence, urine is of low volume and high concentration.
D- Is the mechanism of facultative water reabsorption.

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1	A
2	B
3	D
4	A
5	D
6	B
7	B
8	D :
9	D
10	D
11	A
12	D
13	A
14	: B
15	A
16	C
17	D
18	B
19	B
20	A

21	C
22	D
23	D
24	B
25	D
26	C
27	B
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29	A
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31	C
32	B
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36	C
37	B
38	B
39	B
40	B

41	A
42	D
43	A
44	C
45	D
46	B
47	A
48	B
49	C
50	D
51	C
52	D
53	D
54	B
55	D
56	B
57	B
58	D

- **Higher brain functions**
Postural (or equilibrium) reflexes are the reflexes which maintain the normal posture and equilibrium during rest and movement, and provide a stable postural background for performance of voluntary movements.
- The basis of these postural reflexes is variation in the tone of the different muscles resulting from changes in the excitability of the stretch reflex, caused by changes in the excitability of motor neurons (by supraspinal facilitatory and inhibitory impulses) and by changes in the rate of discharge in γ efferent neurons to muscle spindles. The postural reflexes are integrated at different levels of the CNS (spinal cord, brain stem and cerebrum).

Postural reflexes are classified into 2 main groups:

Static reflexes, which maintain the normal posture during rest, and establish it if the animal has fallen over.

Statokinetic reflexes, which regulate posture during movements.

A disturbing force to equilibrium is **acceleration** (or **deceleration**), caused by a change in the rate or in the direction of movement. Acceleration is **linear**, occurring during movement in a straight line, or **angular**, rotational occurring in rotatory movements.

Detection of acceleration forces is a function of receptors of the vestibular system, present in the inner ear (labyrinth). The vestibular mechanism provides information about the nature of movements of an organism and its position in space.

1) All the following are components of the vestibular apparatus, except:-

- a- Crista ampullaris
- b- Vestibular hair cells
- c- Vestibular nucleus
- d- Sacculle

2) The crista ampullaris is sensitive to:-

- a- sound vibrations
- b- force of gravity
- c- linear acceleration
- d- angular acceleration

3) Vestibular hair cells:-

- a- are provided with the same type of cilia all over their surface
- b- are innervated by cochlear nerve fibers
- c- are stimulated by a chemical transmitter released from the terminals of the innervating nerve fibers
- d- are sensitive to mechanical stimuli

(AV)

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- 4) Hair cells of the cristae are stimulated by:-
a- bending of their stereocilia toward any direction
b- movement of endolymph in any direction
c- bending of stereocilia toward kinocilium
d- bending of stereocilia away from kinocilium

5) Maculae of vestibular apparatus are:-

- a- stimulated by movement of endolymph over their surface
- b- stimulated during standing upright but inhibited in the recumbent posture
- c- alter the pattern of their discharge by head tilting
- d- contain otoconia that press on hair cells to initiate resting basal discharge

6) Asymmetrical bilateral discharge from the SCCs occurs:-

- a- on exposure to a linear movement
- b- during constant speed angular movement
- c- by tilting of the head
- d- in unilateral labyrinthitis (inflammation of labyrinth)

7) Vertigo:-

- a- is a post-rotational sense of being rotated toward opposite side of original rotation
- b- is a post-rotational sense of being rotated toward same side of original rotation
- c- is a rotational sense of being rotated toward opposite side of original rotation
- d- is a rotational sense of being rotated toward same side of original rotation

8) Nystagmus:-

- a- occurs as a result of symmetrical bilateral discharge from the SCCs at the onset of rotation
- b- occurs as a result of symmetrical bilateral discharge from the SCCs at the end of rotation
- c- prevents stabilization of the eye balls on visual objects
- d- is a vestibulo-ocular reflex occurs even in blind persons.

9) Post-rotational alteration of muscle tone:-

- a- results from altered pattern of macular discharge
- b- maintains equilibrium during this phase
- c- results from increased discharge from the SCCs on both sides
- d- results from increased discharge from the SCCs on opposite side of rotation.

10) The reticular activating system is stimulated by all the following, except:-

- a- epinephrine
- b- serotonin
- c- acetylcholine
- d- norepinephrine

(A₂)

- 12) The hypothalamus protects the body against hypoglycemia by:-
- a- inhibiting insulin release
 - b- increasing glucagon release
 - c- increasing thyroxin release
 - d- increasing sympathetic activity and increase epinephrine release
- 13) The hypothalamic nucleus that act as a biological clock of the body is:-
- a- supraoptic nucleus
 - b- preoptic nucleus
 - c- arcuate nucleus
 - d- suprachiasmatic nucleus
- 14) β – waves of the EEG:-
- a- are observed during relaxed wakeful state
 - b- are faster than α – waves but slower than theta waves
 - c- disappear when the person becomes alert
 - d- are observed during REM sleep
- 15) Slow wave sleep is characterized by:-
- a- predominance of the high voltage waves in EEG
 - b- occurrence of dreams
 - c- irregularity of heart rate and respiratory rate
 - d- being a light type of sleep
- 16) The prefrontal area is concerned with all the following, except:-
- a- adjusting behavior
 - b- thoughts
 - c- speech
 - d- sexual behavior
- 17) Damage of the general interpretative area causes all the following effects, except:-
- a- failure of articulation
 - b- failure to deeply understand written words
 - c- failure to deeply understand spoken words
 - d- sensory aphasia

(H 3)

- 24-23
-) Lesions of the speech center in frontal lobe results in:-**
- a- paralysis of speech muscles
 - b- inability to select appropriate words for use in speech
 - c- inability to understand spoken language
 - d- failure of coordination of speech muscles

-) Retrograde amnesia indicates:-**
- a- inability to consolidate memories
 - b- Inability to recall memories
 - c- Failure of working memory
 - d- Presence of lesions in the hippocampus

20) Vestibular apparatus:

- a) Represent the auditory part of the labyrinth.
- b) May help in initiating the voluntary movements.
- c) Contains receptors concerned with regulation of body posture and equilibrium.
- d) Has no role in perception of acceleration.

21) Vestibular apparatus:

- a) Consists of semicircular canals only.
- b) Contains two types of sensory organs, crista and macula that discharge impulses along the 8th cranial nerve.
- c) Located inside the petrous portion of temporal bone.
- d) Can discharge impulses that affect muscle tone in distal muscles of the limbs only.

22) The semi-circular canals:

- a) 3 pairs on each side.
- b) Detect the angular acceleration.
- c) Contains fluid rich in Na^+ ions.
- d) Its receptors show depolarization when Na^+ influx in the apical border of its hair cells.

23) The hair cells in the vestibular receptors organs:

- a) Only stimulated during acceleration.
- b) Show hyper-polarization when stereocilia deviated towards kino-cillum.
- c) Show depolarization when stereocilia deviated towards kino-cillum.
- d) Show depolarization when stereocilia deviated away kino-cillum.

24) All of the following about the vestibular apparatus are true except:

- a) It consists of semicircular canals and two small sacs, utricle and saccule.
- b) The semicircular canals contain sensory organs called crista.
- c) The utricle and saccule are concerned with perception of linear acceleration.
- d) concerned with regulation of muscle tone during performance of fine skilled movement.

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- The central connection of the vestibular apparatus include all of the following except:**
- a) Cerebellum.
 - b) Reticular formation.
 - c) Medial longitudinal bundle on both sides.
 - d) Limbic cortex.

26) Endolymph:

- a) It is around utricle and saccule.
- b) Has a high Na concentration.
- c) has the higher density than cupula, but the same density as otoconia.
- d) Inertia has no role in the stimulation of receptors in the semicircular canals during rotation.

27) The hair cells in the semicircular canals are stimulated by:

- a) Movement of the perilymph.
- b) Linear acceleration.
- c) Rotation at constant velocity.
- d) Movement of the endolymph relative to the hair cells.

28) About the utricles all of the following is true except:

- a) Are gravity receptors.
- b) Contain hair cells.
- c) Contain endolymph which communicates with that in the SCCs and cochlea.
- d) Can not initiate reflex changes in muscle tone.

29) About Nystagmus:

- a) Vestibular nystagmus occurs only at the onset of rotation.
- b) Vestibular nystagmus has 2 components fast and slow.
- c) Fast component of vestibular nystagmus play a role in maintenance of equilibrium while slow component disturb equilibrium.
- d) Spontaneous nystagmus can occur physiologically.

30) The receptors of postural reflexes include all of the following except:

- a) Muscle spindles.
- b) Rods and cones.
- c) Arterial baro-receptors.
- d) Crista and sacula.

31) The reticular activating system:

- a) Its neurons are located in the midbrain.
- b) Its neurons can be inhibited by epinephrine.
- c) Its neurons can be activated by sensory signals from proprioceptors.
- d) Serotonin can easily activate its neurons and increases alertness and wakefulness.

HS

All of the following about reticular formation are true except:
its excitatory part locates mainly in the pontine region.
a) Its inhibitory part located mainly in the medulla oblongata and send inhibitory impulses to all cortical areas.
c) Its excitatory part is the reticular activating system (R.A.S.).
d) Its excitatory part (R.A.S.) discharges stimulatory impulses to both cerebral cortex and A.H.Cs of the spinal cord.

33) Hypothalamus regulates:

- a) Body weight.
- b) Body equilibrium.
- c) Muscle tone.
- d) Voluntary movements.

34) The limbic system consists of the following except:

- a) Cingulate gyrus.
- b) Hippocampus.
- c) Sub-callosal gyrus.
- d) Caudate nucleus.

35) Speech centers include the following except:

- a) Visual association area 18 and 19.
- b) Auditory association area 22.
- c) Broca's area 44,45.
- d) Sensory association area 5,7.

36) Sensory aphasia results from lesion in:

- a) Visual pathway.
- b) Auditory pathway.
- c) Broca's area 44, 45.
- d) Visual association area 18 and 19.

37) Motor aphasia results from lesion in:

- a) Area 4.
- b) Area 6.
- c) Exner's area.
- d) Auditory association area 22.

38- Concerning reticular formation:

- A- It is purely concerned with sensory functions.
- B- Its sensory neurons are facilitatory to spinal cord and cortex..
- C- Its sensory neurons are inhibitory to spinal cord.
- D- Its sensory neurons are interconnected and allow divergence, convergence and afterdischarge.

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S

- 40- Concerning reticular formation, all are true EXCEPT:
- A- It receives various somatic and special sensory information.
 - B- Its inhibitory motor part inhibits the spinal cord.
 - C- Its facilitatory motor part excites both the cortex and the spinal cord.
 - D- All its motor parts have intrinsic activities.

- Concerning reticular formation, all are true EXCEPT:
- A- It excites all parts of cortex through ARAS.
 - B- It is a link between higher and lower CNS centers.
 - C- It is responsible for perception and localization of fast pain.
 - D- It is responsible for brain electrical activity.

41- Regarding Evoked brain potentials:

- A- It is used for mapping of the brain.
- B- It is recorded in a conscious person.
- C- It consists of a primary diffuse wave followed by a secondary localized wave.
- D- It is due to activity of RAS.

42- Electroencephalogram:

- A- Recorded in an anaesthetized person.
- B- Represents summation of EPSP & IPSP in brain neurons.
- C- Theta waves dominate in adult during brain rest.
- D- Beta waves are recorded in light sleep.

43- Brain waves:

- A- Regular synchronized alpha waves are recorded in paradoxical sleep.
- B- Desynchronized waves are recorded due to activation of RAS.
- C- High voltage low frequency waves are recorded in adults during resting state.
- D- Activity in non specific thalamic nuclei produces beta waves.

44- EEG:

- A- Is recorded to map the brain.
- B- Is used for diagnosis of sleep stages.
- C- Desynchronized waves are replaced by synchronized waves in response to opening of eyes.
- D- Show low frequency- high voltage waves in case of brain death.

45- Sleep, all are true EXCEPT:

- A- It helps brain rest and brain plasticity.
- B- It may be due to synaptic fatigue of RAS neurons.
- C- It may be due to active inhibition of RAS by sleep centers.
- D- During which, the person is aware of self and surroundings.

All of the following are sleep centers EXCEPT:

- A- Raphe nucleus.
- B- Locus ceruleus.
- C- Reticular formation.
- D- Hypothalamus.
- E- Suprachiasmatic nucleus of hypothalamus.
- F- Nucleus of tractus solitaries.

47- REM sleep differs from Non-REM sleep in:

- A- Has longer duration in the sleep cycles.
- B- Low voltage desynchronized brain waves are recorded during it.
- C- Presence of sleep walking & talking.
- D- Low threshold of arousal.

48- Compared to REM sleep, Non-REM sleep is characterized by:

- A- Dreams and penile erection.
- B- Irregular HR and ABP.
- C- Marked decrease in muscle tone.
- D- Increase in growth hormone secretion.

49- Concerning Learning:

- A- Non associative learning involves classical conditioning and operant conditioning.
- B- Associative learning involves habituation and sensitization.
- C- It is the process of acquiring knowledge or new responses.
- D- It occurs only by instructions and no role for experience in learning.

50- Concerning learning:

- A- Habituation is due to increase intracellular calcium leading to augmented response.
- B- Sensitization occurs by presynaptic facilitation.
- C- Operant conditioning occurs by inducing a response to a neutral stimulus.
- D- Classical conditioning occurs by stimulation of reward and punishment centers.

51- Memory:

- A- declarative memory is the unconscious recall of information.
- B- reflexive memory is stored in basal ganglia and cerebellum.
- C- Sensory memory is the long term recall of information.
- D- Short term memory is due to protein synthesis.

52- Memory:

- A- Sensory memory is due to reverberating circuits and post-tetanic potentiation.
- B- Short term memory involves formation of long lasting memory traces.
- C- Capacity of the brain for short term memory is large.
- D- All types of memory involve the same mechanisms.

(H 8)

Memory, all of the following true EXCEPT:

- A- Retroactive inhibition is the replacement of new short term memory to old one.
- B- Proactive inhibition is the repulsion of old long term memories to new ones.
- C- Working memory is a type of long term memory.
- D- Consolidation of memory is helped by rest, sleep and rehearsal.

4. Concerning speech, all are true EXCEPT:

- A- Sensory aphasia occurs due to defect in visual association area, auditory association area and Wernick's area.
- B- Expressive aphasia occurs due to lesion in Broca's and exner's areas.
- C- Anomic aphasia is due to lesion in and around auditory cortex.
- D- In anomic aphasia, the patient can not give name for seen pictures and words.

55- Regarding dysarthria, all of the following is true EXCEPT:

- A- It is a speech abnormality due to defect in articulation.
- B- It occurs in UMNL & LMNL affecting speech muscles.
- C- It occurs in parkinsonism and cerebellar syndrome.
- D- It occurs due to lesions in speech centers.

56- Regarding association cortex:

- A- Association areas involve most of the cerebral cortex in humans.
- B- Lesion in the representational hemisphere leads to speech disorders.
- C- Lesion in the categorical hemisphere leads to agnosia.
- D- Limbic association cortex is responsible for analysis of the body and its surroundings.

57- Regarding association cortex, all true EXCEPT:

- A- Parito occipito temporal cortex is concerned with analysis of the body and its surroundings and speech.
- B- Lesion in Parito occipito temporal cortex leads to unilateral neglect and aphasia.
- C- Prefrontal association cortex is concerned with higher intellectual functions and personality.
- D- Lesion in prefrontal association cortex produces aphasia

Hq

1	C
2	D
3	D
4	C
5	C
6	D
7	A
8	D
9	D
10	B
11	D
12	D
13	A
14	D
15	A
16	D
17	A
18	D
19	B
20	C

Answers

21	B
22	B
23	C
24	D
25	D
26	D
27	D
28	D
29	B
30	C
31	C
32	B
33	A
34	D
35	D
36	D
37	C
38	D
39	D
40	C

41	A
42	B
43	B
44	B
45	D
46	E
47	B
48	D
49	C
50	B
51	B
52	A
53	C
54	C
55	D
56	A
57	D

H 10